

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF PUBLIC INSTRUCTION

COURSE OF STUDY IN AGRICULTURE
GRADES 7-12



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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF PUBLIC INSTRUCTION
Harrisburg

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FOREWORD

This bulletin has been prepared to present the subject of Agriculture in its more recent scientific aspects and to emphasize the pronounced advantages of its pursuit.

American boys and girls should know something about Agriculture, not only because of its importance in the early development and history of our nation, but because it still ranks as one of the leading industries in the Commonwealth of Pennsylvania and in the nation.

The paramount, economic importance of an adequate food supply; the social necessity of maintaining prosperous farm homes and contented farmers; and the potential advantage of maintaining a maximum fertility of our soils, are problems of such great national importance that every American boy and girl would profit from the background afforded by a course in Agriculture.

The study of Agriculture affords an approach to our most pressing economic, social, and educational problems. It opens to every boy and girl a new enjoyment and appreciation of the great outdoors. In the hands of a skillful teacher, it will provide interest in and add motivation to nearly every subject of the school course.

This bulletin was prepared originally by H. E. Gayman, formerly Supervisor of Junior Projects in this Department. Revision and additions have been made by H. C. Fetterolf and associates in the Vocational Division.

JOHN A. H. KEITH

Superintendent of Public Instruction.

December 1927



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COURSE OF STUDY IN AGRICULTURE

GRADES 7-12

I. Introduction

Agriculture in the rural school and junior high school should function in the following ways:

- A. Interest the school in the community and the community in the school.
- B. Vitalize the curriculum of the school.
- C. Provide educational development of boys and girls through agricultural activities.
- D. Provide pre-vocational experience in agriculture as a vocation.

The materials for study and the methods involved have been suggested with these functions in mind. The work in agriculture cannot be confined to the four walls of the schoolroom. Constantly the farms and field will be used as laboratories; the farmers will aid in solution of problems, the pupils will do at home some of the agricultural activities suggested at the school; habits of thrift, industry, and responsibility will be formed; and experiences gained that will help clarify the choice of agriculture as a vocation.

The junior project especially will contribute to these functions.

The actual raising of a pig or chickens or one of the common farm crops as a part of the school work is perhaps the most effective way to have agriculture fulfill its function in the school curriculum. For this reason the junior project has been particularly stressed.

II Methods

- A. Use the agricultural interests, experiences, and activities of the boys and girls as a basis for all instruction in agriculture.
- B. Use living plants and animals for instruction.
- C. Use textbooks and bulletins merely as aids in securing additional information for the solution of problems.
- D. Motivate each exercise by presenting a real problem for solution.
- E. Each lesson should result in some activity beyond the classroom.
- F. Use abundant illustrative material.
- G. Have pupils participate rather than observe.
- H. Use parents and boys and girls as teachers whenever possible.

- I. Have exhibits whenever possible. Use them to show the community the work being done by the pupils.
- J. Correlate with Art, and English, whenever possible. Make agricultural booklets (See appendix).
- K. Place work on a competitive basis whenever possible. Use the contest idea.
- L. Enlist aid of patrons, prominent farmers, agricultural supervisors, county superintendents, and the Department of Public Instruction.

III. Organization

- A. Combine seventh and eighth grade pupils in one class.
- B. Teach crops, to boys and girls of both grades, one year; teach animals, to boys and girls of both grades, the second year—rotate the subjects.
- C. Use the equivalent of sixty minutes per week for agricultural work.
- D. Do not attempt to teach all the lessons suggested for each month. Select those from each month best adapted to particular community.
- E. The work has been organized on a seasonable basis. Start the junior project in February. Decision, selection, and actual work must not be delayed.

IV. Order of topics

	Crops	Animals
	Lessons on corn.	Poultry—culling; care of moulting hen.
	Seeding of crops—wheat & rye.	Production—egg and milk records.
	Weeds—collect; eradication.	
September	Fruits—peaches, apples, pears, grapes.	Hogs—fattening and marketing.
	Fairs (Co.) (Boys' & Girls' features)	Fairs (Co.) (Boys' & Girls' features)
	Nuts and nut trees.	Pullets—housing for winter.
October	Corn-husking and storing; seed.	Bees—importance to farmer; removing honey.
	Potato studies.	Poultry houses—types & arrangement.
	Fall Arbor Day & Bird Day.	Fall Arbor Day & Bird Day.
November	The garden—preparing for winter.	Fur-bearing animals (trapping) mink, weasel, muskrat, skunk, opossum, raccoon.
	Harvest festival and farm products show.	Dairy cows—care, sanitation.
	Storage of seed for next year's crops.	Poultry for Thanksgiving market.
	Thanksgiving—its festivities.	Poultry show and judging.

	Crops.	Animals
December	Farm machinery—clean, repair, store.	Preparing bees for winter.
	Corn judging and stringing.	Horses, hogs, sheep,—general care
	Potato judging.	Judging cows.
	The woods—crops, as lumber, nuts, fun, etc. Trees in winter.	Judging hogs.
	State Farm Products Show.	State Farm Products Show.
January	Farm machinery—overhaul and repair.	Feeding farm animals—sheep, hogs.
	Rope work.	Farmstock census.
	Map of home farms.	Judging—horses and sheep.
February	Junior Projects.	Junior Projects.
March	Junior Projects.	Junior Projects.
April	Junior Projects.	Junior Projects.
May	Junior Projects.	Junior Projects.

Suggestive lessons and references for each of the lesson topics follow.

SEVENTH GRADE AGRICULTURE

Farm Crops Lessons

I. Selecting seed corn in the field

A. Method of selecting seed corn.

1. While standing, from vigorous, erect stalks with good ears, on long strong shanks.
2. In shocks, while husking, from stalks with desirable characteristics.

B. Actual selection.

1. Take class to nearby cornfield. Each member pick out ear on stalk desirable for seed; class discuss each other's selection. Each pupil then select five best ears, to take back to school.

C. Problems.

Why should we select seed corn for next year's crop this fall?

Why should ears for seed corn be selected while on the stalk?

How can we tell whether an ear will make desirable seed corn?

D. References—(G253) (D133) (S10).*

II. Seeding of crops

A. Method of seeding wheat and rye.

1. Good seed, cleaning, fanning; productive strains.
2. Time to seed; Hessian fly and its destructive work.
3. Machinery used; operation.
4. Amount of seed per acre.

*For key to references, See p. 31.

- B. Pupils report on the crop seeding at their homes, on basis of the problems following:
- C. Problems.
 - When should wheat be seeded here to avoid the Hessian fly?
 - What amount of seed, wheat and rye is drilled per acre?
 - How is soil prepared for planting?
 - What machine is used in seeding wheat? How does it operate
- D. References—(G265) (D154).
 - Reports of County Farm Bureau giving results of Variety Tests of Wheat & Rye.

III. Fruits

- A. Common fruits on the farm.
- B. Varieties of apples, identification methods.
 - 1. Perfect and imperfect apples; methods of preventing imperfect fruit. Pupils will bring apples from home and study varieties and condition.
- C. Problems.
 - What fruit should be grown on every farm?
 - Which are the early and which the late varieties of apples?
 - How do varieties of apples differ in flavor, texture, keeping qualities? What are the best varieties?
 - What care and attention does an orchard require during the year?
- D. References—(G300) (D212) (F. B. 1001).

IV. Agricultural Fairs

- A. Local Fairs.
 - 1. Purpose; educational features; value to community.
- B. County fairs.
 - 1. Purpose, educational features; value to county.
 - 2. Kinds of exhibits at County Fair; classes; study of fair bulletin and premium list.
- C. Activities for pupils.
 - 1. Have pupils participate in boys' and girls' activities at the fair, including exhibits and judging contests.
 - 2. Each pupil attending fair will report on some selected class exhibits, stating varieties and number exhibited, names of exhibitors and giving opinion on exhibits.
 - 3. Enter an exhibit of school work in the county fair.
- D. Problems.
 - Of what value are county fairs?
 - What can be learned by studying exhibits at county fairs?
 - Why are these fairs held in the fall of the year?
 - What crop products are exhibited at the fair this year?
- E. References—(C312).



SELECTING SEED CORN FROM THE FIELD

Each boy has selected a stalk of corn which is tall, strong, leafy, producing an ear which is mature and shows desirable characteristics:
With the help of the teacher the boys select the best stalk.

V. Nuts and nut trees

- A. Kinds of nuts common to Pennsylvania, especially mocker nut, hickory, shell-bark, black walnut, butternut, chestnut, and others.
- B. Value of nut trees.
 - 1. For nuts produced, best kinds.
 - 2. For lumber.
 - 3. As compared with other forest trees.
- C. Activities.
 - 1. Pupils report on kinds of nut trees in community and their location.
 - 2. Each pupil agrees to plant 20 edible nuts every fall for nut trees. This can be done by pressing a nut into the ground with the heel; planting should be done along roadsides and streams, and in thin woods.
 - 3. Make nut booklets.
- D. Problems.
 - Why are nut trees among our most valuable trees?
 - How can we increase the number of nut trees?
 - What care and protection do growing nut trees require?
- E. Reference.
 - "Pennsylvania Trees"—J. S. Illick, distributed by the Pennsylvania Department of Forest & Waters, Harrisburg, Pa.

VI. Corn study

- A. Structure of corn plant, parts and purposes of parts. Relation of corn to other grasses.
- B. Cutting and husking corn—cutting corn, by hand and by machine; machines used. Shocking corn, methods, reasons, changes in the shock. Husking; methods, tools used now and formerly.
- C. Storing corn over winter; corn crop; seed corn, prevent freezing, avoid mice. method of stringing corn.
- D. Corn for the silo.
- E. Problems.
 - How is corn cutting and husking done in other parts of the State? (write to pupils there and inquire.)
 - What kind of machines are used for cutting and husking corn?
 - Should every farmer have a corn binder?
 - Do our fathers handle the seed corn properly over winter?
 - What is the corn variety test conducted by the County Farm Bureau?
- F. Reference—(F. B. 537).

VII. Potato studies

- A. Preparing for a better crop next year.
 - 1. Field selection of seed potatoes. From best producing hills, and disease free plants.
 - 2. Notice effects of spraying in different patches; presence of diseased plants, ravages of insects.
 - 3. Storing potatoes over winter in cool place.
- B. Activities for pupils.
Take class out to study several potato fields before digging; demonstrate hill selection of potato seed.
- C. Problems.
What is the best potato seed?
Where shall we get our potato seed—buy it or select our best seed?
How can we select potato seed from our own fields?
How shall we take care of this seed until time to plant it next year?
What is the weight of a bushel of potatoes in this State?
How much did it cost per bushel, to raise potatoes at my home this year?
- D. References—(G245) (D162) (S1).

VIII. Arbor day and bird day

- A. A manual with suggestions for observing this day can be had, free, by writing to the Department of Public Instruction, Harrisburg, Pa.
- B. The whole school should have a short program on the appointed day, consisting of appropriate recitations and songs. Trees should be planted on the school yard or along the highway where they will protect the road.
- C. Problem.
What can the pupils of the school do to promote tree growing in Pennsylvania?

IX. The garden

- A. Harvesting and disposing of crops.
 - 1. Those to be sold at once.
 - 2. Storage; those to be stored and methods, such as burying, or putting in cellar.
 - 3. Crops to be left in garden, as root crops, winter onions and winter spinach.
- B. Cleaning up garden; spading, turning under crop residues; planting rye and other cover crops—Value of this work.
- C. Mulching perennial crops, as asparagus, strawberries, and some flowers.
- D. Problems.
What effects do frosts have on garden crops?



Arbor Day and Bird Day Exercises may include a pilgrimage to some great tree in the community. Here the history of the tree may be read. Perhaps a pupil or an adult may compose a poem to the tree write a composition in memory of the one who planted or protected the tree: Every Arbor Day should be observed by the intelligent planting of good trees.

How should the home garden be prepared for winter?

What can we do now to enrich the garden for next year?

How are cabbage, celery and beets kept for use during the winter?

E. Reference—(D191) (S30146).

X. Harvest festival and farm products show.

A. Pupils acting as committees will carefully arrange, with the teacher's help, an attractive fall exhibit and show to include the following:

1. Junior project work.
2. Corn (ten ears to each entry).
3. Potatoes (one half peck to each entry).
4. Fruit (5 specimens to each entry).
5. Vegetables and garden produce.
6. Canned goods.
7. Flowers.

B. Have evening program of recitations, singing and addresses. Exhibits should be judged and ribbons awarded.

C. Problems—

How can we have a big Harvest Festival at our school each year?

D. References—

"The Community Fair," Ext. Bul. No. 27, Massachusetts Agricultural College, Amherst, Mass.

XI. Storing farm products for winter use.

- A. Seed, such as corn, potatoes, oats and garden seed.
- B. Farm feeds; oats, corn silage, timothy, and alfalfa hay.
- C. Orchard products, as apples, pears, plums, peaches.
- D. Animal products, eggs, pork, milk products.
- E. Problems.

How is corn saved for next year's crop?

How is silage preserved for later feeding?

How are apples stored for use next spring?

How does smoking and curing preserve meat?

XII. Thanksgiving.

- A. History and meaning of the day.
- B. The farmer's dependence on Divine aid through Nature.
- C. Use farm products for decorating, such as corn stover and pumpkins.
- D. Problems.

How can we properly observe Thanksgiving?

Can the farmer depend only upon his own help and knowledge in raising crops or animals?

XIII. Farm machinery.

- A. Winter attention required.
 - 1. Clean and oil implements and machinery.
 - 2. Repair and replace parts.
 - 3. Store and house for winter.
- B. Activities for pupils.
 - 1. Make an inventory of farm implements at their homes.
State kinds of implements, number, probable value; repairs needed, how stored.
 - 2. Each pupil to get some practice in cleaning and repairing implements for winter storage; pupils to report on work they do.
 - 3. Make farm machinery booklet.
- C. Problems.
 - How is a grain binder put in condition for winter storage?
 - How is a new handle fitted on a hay fork?
 - How are new teeth put on mower blades? (D385)
- D. References—(F. B. 946, 947).

XIV. Corn judging.

- A. Use of score card. Write to School of Agriculture, State College, Pa. for corn score cards. Pupils should bring good ears of corn from their homes, arrange them in ten-ear samples, and judge these samples. Arrange with supervisor of vocational agriculture or with county agent to assist in this work.
- B. Problems.
 - How does corn judging help us to know good corn?
 - What contests can we enter to make use of this knowledge?
- C. References—(G260) (D135) (C109).

XV. Potato judging.

- A. Varieties of potatoes, especially those grown locally.
- B. Methods in judging potatoes; disease free, good quality, true-ness of type. Pupils should bring potatoes from home for judging practice at school.
- C. Problems.
 - What varieties of potatoes are best for raising in our section?
 - What common diseases do potatoes have?
 - Do any of our potatoes have scab or fusarium wilt?
 - Why are potatoes grown in northern localities or at high altitudes to be preferred for seed?
- D. References—(162) (C108).
 - Chart on Potato Diseases, Ohio Exp. Station, Wooster, Ohio.

XVI. The woods.

- A. Crops from the woods, nuts, furs, lumber.
- B. Lumber—kinds, cutting, care of woods.
- C. Winter work in the farm woods.
- D. Problems.

What do we get from the woods on our farms?

What kinds of trees are growing in the home wood lot, and for what is each kind useful?

What kind of wood should be cut for fuel each winter?

Have pupils make a collection of local leaves—mount these on cardboard and use mounts to study leaf identification.

- E. References—(G313) (D178) (F.B.1117).

XVII. Pennsylvania State Farm Products Show.

- A. Exhibits.
 - 1. Obtain catalog from Secretary of Agriculture, Harrisburg, Pa.
 - a. Classes.
 - b. Prizes offered.
 - c. Special features.
- B. Educational meetings.
 - 1. Obtain program of meetings from Secretary of Agriculture.
 - a. Organizations of farmers which meet.
 - b. Topics to be discussed.
 - c. Speakers.
- C. Activities.
 - 1. Have pupils send in exhibits to be entered in boys' and girls' classes, especially corn, potatoes, and eggs.
 - 2. Have each pupil select a subject from the program of speeches, and talk to the class about it.
 - 3. Compile a list of all premiums won by farmers, boys and girls of your county.

XVIII. Rope work.

- A. Uses of rope on the farm.
- B. Construction and kinds of rope.
- C. Practice for pupils.
 - 1. Making knots. Each pupil master at least the following knots; square, bowline, miller's, weaver's, slip and binder knots; double half hitch, timber hitch and clove hitch; whipping.
 - 2. Making splices; short splice, eye splice, crown and end splice.

D. Problems.

How is a bowline knot made and used?

How can two pieces of rope be spliced together?

E. Reference—(D376).

XIX. Map of home farms.

A. Making a map.

1. Showing buildings, roads, fields, woods, streams.

2. Drawing map to scale.

3. Laying off the farm on paper, showing measurements.

B. Using map.

1. Suggest changes for improved layout of the farm home.

C. Problems.

How are maps made?

How shall we make maps of our homes?

What improvements would we suggest in the arrangement of our farms?

XX. Pruning.

A. Pruning—grapes, fruit trees, raspberries, etc.

B. How to prune various trees and bushes.

C. Pruning required when transplanting young trees.

D. Pruning old apple trees.

E. Practice. See that the class gets some pruning practice during the spring; obtain assistance of a local orchardist.

F. Problems.

How shall we prune an old apple tree?

How shall we prune a young apple tree ready to be planted?

How shall we prune grape vines?

G. References—(G304, 367) (C27) (C28, 208) (S34).

XXI. The work in agriculture for the remainder of the year should be devoted to junior home projects. (See Appendix A. "How to organize and conduct junior home project work.") This involves both school and home work. Each pupil should select one of the projects suggested for this year, viz:

A. Growing corn.

B. Growing a garden.

C. Growing potatoes.

D. Growing truck as beans, cabbage, strawberries, sweet corn, tomatoes, etc.

An analysis of the factors involved in each project follows. The "activity steps" are the actual jobs the boy or girl must do in the execution of the practical work. They are here expressed actively so that the teacher by inquiring as to the different "activity steps" taken may know at once the status of the home work of the project.

In the column "knowledge required" is listed the information needed by the pupil to take successfully the "activity steps." This is the basis for the school work. A great deal of this information the pupil will have as a result of the class exercises in agriculture from September to February. Teach only those things in the "knowledge required" column that the pupil does not know.

Corn Project—Grow Corn

Activity Steps	Knowledge Required
1. Select variety	1. Varieties of corn. 2. Adaptations to community and use.
2. Select land for planting	1. Soils best for corn. 2. Fertility. 3. Location.
3. Secure seed	1. Best time to select seed. 2. Advantages of local or foreign seed. 3. Advantages of pure bred seed. 4. Amount. 5. Cost.
4. Test seed corn for germination	1. Preparation for test. 2. Methods of making test. 3. Germination requirements. 4. Reading the test.
5. Prepare soil for planting	1. Implements needed. 2. Time of year. 3. Operations. 4. Requirements of good seed bed.
6. Plant seed	1. Time to plant corn. 2. Depth of planting. 3. Distance in row and between the rows. 4. Rate. 5. Fertilizer to use.
7. Cultivate the crop	1. Time of cultivation for corn. 2. Frequency. 3. Depth. 4. Nearness to stalks.
8. Cut and shock the corn	1. Indications of maturity. 2. Time of year. 3. Methods and material used and needed.
9. Husk the corn	1. Proper time to husk. 2. Methods and materials needed.
10. Store the corn	1. Storage requirements of corn. 2. Time of year to sell corn.
11. Sell the corn	1. Price. 2. Markets.

Reference: Farmers' Bulletin, U. S. Department of Agriculture—No. 537—
How to grow an acre of corn.

Garden Project—Grow a Garden

Activity Steps	Knowledge Required
1. Select land for garden	<ol style="list-style-type: none"> 1. Kinds of soil best for garden. 2. Amount. 3. Location and drainage.
2. Plan the garden	<ol style="list-style-type: none"> 1. Space requirements of different plants. 2. Light requirements of different plants. 3. Vegetables to be planted. 4. Maturity requirements of different crops. 5. Succession cropping. 6. Inter-cropping.
3. Secure manure and fertilizers	<ol style="list-style-type: none"> 1. Kinds of fertilizers. 2. Value of manure for garden. 3. Rate and time of application.
4. Secure seeds	<ol style="list-style-type: none"> 1. Best seed houses. 2. Amount and kind needed. 3. How and when to order.
5. Grow young plants	<ol style="list-style-type: none"> 1. Time to start seeds. 2. Requirements for growing seeds. 3. Diseases and methods of control.
6. Spade the garden	<ol style="list-style-type: none"> 1. Time of year. 2. Conditions of soil for spading. 3. Method.
7. Prepare seed bed	<ol style="list-style-type: none"> 1. Tools necessary. 2. Requirements of a good soil.
8. Plant the seeds and plants	<ol style="list-style-type: none"> 1. Requirements of different seeds and plants as to depth, time of planting, distance between rows, etc. 2. How soon after planting. 3. How soon after rains. 4. Depth for different plants. 5. Frequency.
9. Cultivate the garden	<ol style="list-style-type: none"> 1. Method 2. Frequency.
10. Harvest vegetables	<ol style="list-style-type: none"> 1. Preparations necessary for market. 2. Requirements of market. 3. Market price.
11. Sell the vegetables	

References: Farmers' Bulletins, U. S. Department of Agriculture—No. 937 and 1044.

Pennsylvania State College—Bulletin 76.



A garden project affords the opportunity of "mixing
brains with muscle".

Potato Project—Grow Potatoes

Activity Steps	Knowledge Required
1. Select variety	<ol style="list-style-type: none"> 1. Varieties of potatoes. 2. Demands of market. 3. Tendency to freedom from disease.
2. Secure seed	<ol style="list-style-type: none"> 1. Where can seed be secured. 2. Advantages of disease-free seed. 3. Amount of seed needed. 4. Cost.
3. Select land for planting	<ol style="list-style-type: none"> 1. Soils best adapted for potatoes. 2. Location and drainage. 3. Fertility of soil. 4. Amount of land.
4. Care for seed	<ol style="list-style-type: none"> 1. Methods to prevent sprouting. 2. Methods to prevent rotting.
5. Prepare soil for planting	<ol style="list-style-type: none"> 1. Implements and machines needed. 2. When to prepare soil. 3. Cost.
6. Secure fertilizer	<ol style="list-style-type: none"> 1. Kinds of fertilizer best for potatoes. 2. Amounts needed. 3. Cost. 4. Where secured.
7. Plant the seed	<ol style="list-style-type: none"> 1. When should potatoes be planted. 2. Depth of planting. 3. Distance in row and between the rows. 4. Application of fertilizer.
8. Cultivate the crop	<ol style="list-style-type: none"> 1. Time of cultivation. 2. Frequency of cultivation. 3. Depth of cultivation. 4. Last cultivation.
9. Spray the crop	<ol style="list-style-type: none"> 1. Time of sprayings. 2. Frequency of sprayings. 3. Materials needed. 4. Method of application.
10. Dig the potatoes	<ol style="list-style-type: none"> 1. When crop is mature. 2. Condition of soil best for digging.
11. Store the crop	<ol style="list-style-type: none"> 1. Storage requirements.
12. Sell the potatoes	<ol style="list-style-type: none"> 1. When to market potatoes. 2. Best market. 3. Prevailing price.

References: "Successful Potato Growing"—The Baret Co., Baltimore, Md.

"The Spraying of Potatoes"—Extension Circular—Pa. State College.

Truck Project—Grow beans, cabbage, strawberries, sweet corn, tomatoes, etc.

Activity Steps	Knowledge Required
1. Select land	<ol style="list-style-type: none"> 1. Kinds of soil best for particular crop. 2. Amount of land. 3. Location drainage, etc.
2. Secure seed or plants	<ol style="list-style-type: none"> 1. Varieties needed. 2. Where they can be secured 3. Amount needed
3. Secure manure or fertilizer	<ol style="list-style-type: none"> 1. Kinds and amounts for particular crops. 2. Needs of particular soils. 3. Methods of application. 4. Cost.
4. Prepare soil for planting	<ol style="list-style-type: none"> 1. Time of year. 2. Implements needed. 3. Condition of soil. 4. Cost of preparation.
5. Plant the plants or seeds	<ol style="list-style-type: none"> 1. Time of year. 2. Time of day. 3. Depth. 4. Distance in row and between rows.
6. Cultivate the crop	<ol style="list-style-type: none"> 1. How soon after planting. 2. Frequency. 3. How soon after rain. 4. Depth for particular crops. 5. Implements to use.
7. Protect from diseases and pests	<ol style="list-style-type: none"> 1. Insects and pests common to particular crops. 2. Method and materials to control.
8. Harvest the crops	<ol style="list-style-type: none"> 1. Time to harvest different crops. 2. Selection of seed for future planting. 3. Method.
9. Sell the product	<ol style="list-style-type: none"> 1. Preparation for market. 2. Market demands. 3. Market price.

Reference: Pennsylvania State College, Bulletin 76.

EIGHTH GRADE AGRICULTURE

Farm Animal Lessons

1. Culling poultry.

A. Method of culling.

1. Examination of hens giving consideration to age, condition of bird, color of beak, skin and shanks, condition of molt, comb, vent, condition of abdomen and pelvic bones.

- B. Actual culling practice.
 1. Demonstrate to pupils on a few hens.
 2. Give pupils practice in handling and examining hens.
 3. Have pupils cull their home flock.
- C. Problems.

Why should the hens be culled several times during the summer and in the fall of the year?

What is the relation of culling to egg production?

How often should culling be done?
- D. References—(S-21) (Pa. 52).

II. Production records.

- A. Their use, desirable forms, value, etc.
- B. Activities.
 1. Have pupils design forms for keeping records of milk production and egg production.
 2. Have pupils keep accurate production records on cows and poultry at home.
- C. Problems.

Does your father keep records of milk production of his cows?

Why should we keep accurate records of eggs and milk?

Can you give any reason for the difference in production from different cows and flocks of hens?

Calculate totals and averages for two months on cows and hens.
- D. References: (D307) (Pennsylvania State College).
Poultry Calendar and Milk Record Sheets, published by the Pennsylvania State College.

III. Hogs.

- A. Breeds common to community, other breeds, importance of hogs on the farm, age when marketed, how long to fatten, feeds used, best time to market.
- B. Take class to prominent hog farmers or breeders in the community. Discuss with him the topics above. Secure information and literature from breeder's organizations.
- C. Problems—How much is a good gain per day per hog during the fattening period?
How much does it cost to fatten a hog on your home farm?
How can you estimate the weight of a hog without weighing?
- D. References: (G416) (D300)

IV. Fairs, especially the county fair.

See lesson IV. Seventh Grade Agriculture. Emphasize especially classes of livestock, the special boys' and girls'

features and have as many boys and girls as possible participate in judging events.

V. Pullets.

- A. Emphasize, feeding previous to housing, house needed, interior fixtures, importance of time of hatching, feeding and care.
- B. Activities.
 1. Observe home conditions and conditions of one of the successful poultry men of the community. Compare methods and report to class.
 2. Figure size of house for 100 hens, including floor space, window space, number of perches and location, number of nests, etc.
- C. References: (G430) (D305) (C73)

VI. Poultry houses.

- A. Types of houses, plans, how to build, location, runs, fixtures.
- B. Activities—Visit several of the better poultry houses of the community, and observe construction, location, etc.
- C. Problems.

What is the best kind of a floor for the house?
 How is ventilation secured in poultry houses?
 What is the best material for the roof?
 How much floor space must you have for 100 hens?
- D. References: (G430) (C73) (S36)
 "Poultry Housing for Penna."—Ext Cir. Pennsylvania State College.

VII. Bees.

- A. Value of bees; their importance to farmer, importance to flowers and fruits; their house or hive, care necessary, the making of honey.
- B. Have pupils report on experiences they have had with swarms of bees, locating bee trees, how to prevent stinging.
 1. Make bee booklets.
- C. Problems.

What are the names of the different kinds of bees in a colony?
 What is meant by "swarming"?
 How much honey can be taken from a hive in a year?
 How can you locate a bee tree?
- D. References: (D321) (G348) (C238) (F. B. 1198).

VIII. Arbor Day and Bird Day.

See lesson VIII. Seventh Grade Agriculture.

IX. Fur bearing animals.

- A. Kinds of fur bearing animals common to Pennsylvania, as mink, weasel, muskrat, skunk, opossum, raccoon, fox, rabbit, squirrel, bear. Their habits and characteristics.
- B. Activities—Have pupils report on methods of capturing, preparing pelts, selling value, laws relating to trapping, bounties.
- C. Problems.
Which animals hibernate in winter?
Do you know of any one who has a “fur” farm?

X. Dairy cows.

- A. Dairy breeds, housing, care, sanitary production of milk.
- B. Visit the dairy of one of the progressive dairy farmers in the community. Have him tell about the care he gives his cows.
- C. Problems.
How many pounds of feed does the average cow consume in a year?
What is the average production of milk per cow per year in your county; in Pennsylvania?
What is meant by roughage, concentrates, succulence?
What is meant by “dairy type”?
- D. References: (G366) (C124) (D279).

XI. Poultry for Thanksgiving.

- A. Poultry most commonly used at Thanksgiving—turkeys, ducks, geese, guineas. How to fatten properly, prepare each for market, and market.
- B. Have appropriate exercises centering interest around Thanksgiving and the part the turkey plays in Thanksgiving festivities.
- C. References—(G434, 439) (C121).

XII. Poultry show.

- A. Pupils should stage a poultry show at the school. Teacher may act as advisor to committees.
- B. Activities—Secure crates, exhibitors, labelling tags, ribbons as awards. Each pupil having a poultry junior project should exhibit. Pupils should judge the different classes. Compare results with placing of an official judge.
- C. References—(G441) (S79).

XIII. Bees.

- A. Bees in winter—place of hive, means of protection from cold, feeding requirements, activities of bees in winter.
- B. Activities—Visit an apiary, observe and report on conditions around the hive.

C. Problems.

On what do bees feed in winter?

Is the swarm as large in December as in June?

Would it be wise to provide heat for bees in winter?

D. References: (G349) (C238) (D321) (S. K. 213) (F. B. 1012-1014).

XIV. Care of stock.

A. Winter quarters and care of horses, cows, hogs and sheep.
Study especially feeding requirements in winter, relation of exposure to amount and kinds of feed; value of grooming.

B. Problems.

Why are hogs less closely confined than horses and cows?

What diseases are liable to result from too much exposure; from too close confinement?

XV. Judging cows.

A. Secure score card from Pennsylvania State College. Study carefully all the words mentioned on the card. Learn to locate all the parts of the cow mentioned on the card. Form an ideal in mind of a good cow. Write Breed Associations for Photo and Charts.

B. Arrange with farmer for use of some cows for judging work. Go as a class to the farm and do practice judging. Ask some one in community who is a good dairy judge to check upon results.

C. References: (S59) (C102) (Pa. 52, Extension Circular).

XVI. Judging hogs.

Same procedure as for judging cows.

References: (C105) (D300) (Pa. 52, Extension Circular).

XVII. State Farm Products Show.

Same as Lesson XVII, Seventh Grade.

XVIII. Birds and the farmer.

A. Know common birds; feeding habits, nesting habits, value to farmer, how to protect, how to encourage.

B. Activities—Make bird houses.

C. Problems.

What birds are protected by law? Why?

What birds are not protected by law? Why?

What is a "bird preserve"?

D. References: (D240) (G334) (C200).



Judging Horses—Pupils of all ages enjoy a contest of this kind.

XIX. Farm stock census.

- A. Number and kinds of stock on pupil's home farm and in community.
- B. Activities—Have pupils prepare census forms for use. Have each pupil make a census of animals on home farm. Tabulate and have complete census of community. Make a stock map of the community.
- C. Problems.

Has a census ever been made of the stock on your farm before? By whom made? What was included that you did not include?

XX. Judging horses and sheep.

Follow same procedure as outlined in lesson XV—Eighth grade, for judging cows.

References: (C91) (D275) (Pa. 52, Extension Circular).

XXI. The work in Agriculture for the remainder of the year should be devoted in junior home projects. (See Appendix A. "How to organize and conduct junior home project work.") This involves both school and home work. Each pupil should select one of the projects suggested for this year, viz:

- A. Raising chicks.
- B. Keeping poultry for eggs.
- C. Raising pigs.
- D. Raising a calf.
- E. Raising rabbits.
- F. Keeping bees.

An analysis of the factors involved in each project follows.

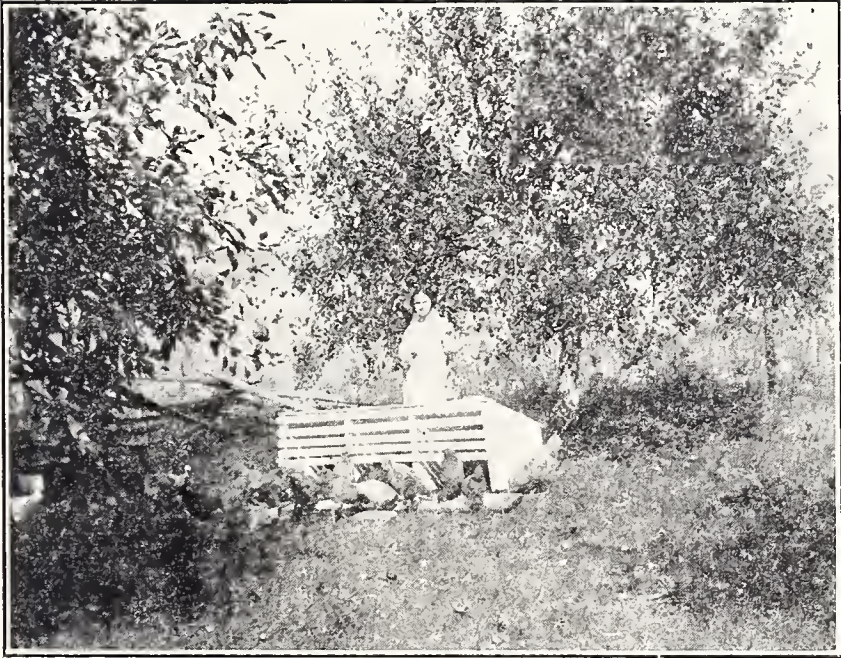
The "activity steps" are the actual jobs the boy or girl must do in the execution of the practical work. They are here expressed actively so that the teacher by inquiring as to the different "activity steps" taken may know at once the status of the home work of the project.

In the column "knowledge required" is listed the information needed by the pupil to take successfully the "activity steps." This is the basis for the school work. A great deal of this information the pupil will have as a result of the class exercises in agriculture from September to February. Teach only those things in the "knowledge required" column that the pupil does not know.

Poultry Project—Raise Chicks

Activity Steps	Knowledge Required
1. Select a breed	<ol style="list-style-type: none"> 1. Kinds of breeds—advantages and disadvantages. 2. Adaption of particular breed to particular needs. 3. Personal fancy.
2. Secure eggs	<ol style="list-style-type: none"> 1. Number of eggs needed. 2. Where eggs may be secured. 3. When to secure eggs. 4. Cost.
3. Make and place the nest	<ol style="list-style-type: none"> 1. Materials best for nests. 2. Side and shape of nest. 3. Best location for nest.
4. Set the hen	<ol style="list-style-type: none"> 1. What constitutes a good "sitter". 2. How to determine above. 3. Time of day to set hen. 4. Number of eggs per hen.
5. Care for the sitting hen	<ol style="list-style-type: none"> 1. Food requirements. 2. Disease and lice prevention.
6. Care for the hatch	<ol style="list-style-type: none"> 1. When to expect hatch. 2. Attention required while hatching.
7. Prepare coop for chicks	<ol style="list-style-type: none"> 1. Materials to be used. 2. Size of coop. 3. Protection from rodents and animals. 4. Disinfection methods. 5. Location.
8. Take the hatch from the nest	<ol style="list-style-type: none"> 1. How soon after hatching. 2. Method of handling. 3. Time of day. 4. Treatment for lice.
9. Feed the young peeps	<ol style="list-style-type: none"> 1. Time for first feed. 2. Kinds and amount of first feed. 3. Feeding methods for first two weeks.
10. Feed and care for growing chicks	<ol style="list-style-type: none"> 1. Feeding methods for growing chicks. 2. Importance of cleanliness, regularity, etc.
11. Dispose of surplus stock	<ol style="list-style-type: none"> 1. Best age for selling surplus stock. 2. Markets best for particular product.

References: Farmers' Bulletins, U. S. Department of Agriculture, Number 1040, 1108, 1111.



A Poultry Project—An orchard makes a desirable place for raising young chicks.

Poultry Project—Keep Poultry

Activity Steps	Knowledge Required
1. Select the breed	<ol style="list-style-type: none"> 1. Kinds of breeds—advantages and disadvantages. 2. Adaptation of particular breeds to particular needs. 3. Personal fauety.
2. Secure the birds	<ol style="list-style-type: none"> 1. Where particular breed can be secured. 2. Approximate cost. 3. Best age for laying. 4. Purity of stock.
3. Prepare house	<ol style="list-style-type: none"> 1. Size house necessary. 2. Desirable location. 3. Standards for interior fixtures.
4. Feed the hens	<ol style="list-style-type: none"> 1. Best food for egg production. 2. Amount of feed at a feeding. 3. Methods of feeding.
5. Care and manage the flock	<ol style="list-style-type: none"> 1. Methods of disease prevention and control. 2. Adjuncts to feeding for egg production. 3. Food, water cleanliness, and regularity as essential as management. 4. Cost of food and management.
6. Collection and care of eggs	<ol style="list-style-type: none"> 1. Time to collect. 2. Method of collection. 3. Storage of eggs.
7. Sell the eggs	<ol style="list-style-type: none"> 1. Frequency of selling for good quality. 2. Where are good markets?

References: Farmers' Bulletins—U. S. Department of Agriculture, 889, 898, 1040, 1105, 1112, 1113.

Pennsylvania State College, Bulletins 47 and 62.

Pig Project—Raise and Fatten Pigs

Activity Steps	Knowledge Required
1. Select the breed	<ol style="list-style-type: none"> 1. Different breeds of pigs and advantages and disadvantages.
2. Secure the pig	<ol style="list-style-type: none"> 1. Where particular breeds can be secured. 2. Probable cost. 3. Advantages of pure bred. 4. Individual points to be considered in selecting pig. 5. Desirable age for fattening.

Pig Project—Raise and Fatten Pigs
(Continued)

Activity Steps.	Knowledge Required.
3. Provide shelter.	<ol style="list-style-type: none"> 1. Type of pen needed. 2. Size. 3. Location desirable.
4. Provide range	<ol style="list-style-type: none"> 1. Size or space per pig. 2. Location. 3. Fencing requirements. 4. Crops to be grown in range.
5. Keep the pig growing	<ol style="list-style-type: none"> 1. Proper food requirements. 2. Proper water requirements. 3. Proper exercise needed for hogs. 4. Proper health requirements.
6. Fatten the pig	<ol style="list-style-type: none"> 1. Food, water, and exercise requirements for fattening.
7. Sell the pig	<ol style="list-style-type: none"> 1. Age to sell. 2. Condition of salable fattened pigs. 3. Price required for profit.

References: Farmers' Bulletins, U. S. Department of Agriculture—No. 874—Swine Management.

Pa. 77—Swine Feeding and Management.

Calf Project—Raise a Calf

The junior project in calf raising should be limited to the more mature boys and girls. Pure bred calves are desirable if proper supervision can be secured and if a sufficient group is interested in a particular breed.

Activity Steps (Things the pupil must do.)	Knowledge Required (to do the activities successfully)
1. Select breed	<ol style="list-style-type: none"> 1. Different breeds of dairy cattle. 2. Adaption of breeds for particular purposes and conditions.
2. Buy calf	<ol style="list-style-type: none"> 1. Where desirable calf can be secured. 2. Probable cost. 3. Individual points to be considered in buying calf. 4. Advantages of pure breeds vs. grades.
3. Wean calf	<ol style="list-style-type: none"> 1. At what age calves should be weaned. 2. Method of teaching calves to drink from pail.
4. Feed calf	<ol style="list-style-type: none"> 1. Necessary foods—concentrates, roughage. 2. Frequency of feeding. 3. Amount at different ages. 4. Importance of minerals in the ration.
5. Care for calf	<ol style="list-style-type: none"> 1. Importance of abundant and good food and water. 2. Importance of shelter. 3. Importance of grooming and care.

References :

Farmers Bulletin, U. S. Department of Agriculture, No. 777.

Pennsylvania State College—Circular 60—Raise the Heifer Calf.

Rabbit Project—Raise Rabbits

Activity Steps	Knowledge Required
1. Select breed	<ol style="list-style-type: none"> 1. Different kinds of rabbits. 2. Advantages and disadvantages of each.
2. Secure rabbits	<ol style="list-style-type: none"> 1. Where particular breed may be secured. 2. Number desired. 3. Probable cost.
3. Make a hutch and pen	<ol style="list-style-type: none"> 1. Desirable size. 2. Materials needed. 3. Method of construction to provide convenience and protection.
4. Feed and care for rabbits	<ol style="list-style-type: none"> 1. Necessity of proper food. 2. Necessity of pure water. 3. Necessity of cleanliness. 4. Proper handling.
5. Mate rabbits	<ol style="list-style-type: none"> 1. Age of mating. 2. Selection of mate. 3. Frequency of mating.
6. Wean young rabbits	<ol style="list-style-type: none"> 1. Age of weaning. 2. Food for young rabbits—kinds and amounts.
7. Sell surplus stock	<ol style="list-style-type: none"> 1. Demands of market. 2. Reliability of buyer. 3. Preparing rabbits for shipment.
8. Crate for shipment	<ol style="list-style-type: none"> 1. Requirements of good shipping crates. 2. Where secured.

Reference : Farmers' Bulletin, U. S. Department of Agriculture, 1090.

Bee Project—Keep Bees

Activity Steps	Knowledge Required
1. Secure a swarm	<ol style="list-style-type: none"> 1. Where swarms may be purchased. 2. How to secure a wild swarm.
2. Secure a hive	<ol style="list-style-type: none"> 1. Where hives can be purchased. 2. Possible cost. 3. Desirable kinds.
3. Place the hive	<ol style="list-style-type: none"> 1. Best location for bees. 2. Distance from the ground. 3. Distance between the hives.
4. Hive the swarm	<ol style="list-style-type: none"> 1. Equipment needed for handling bees. 2. Operations and methods of "hiving".

Bee Project—Keep Bees.
(Continued)

Activity Steps	Knowledge Required
5. Place supers.	1. When additional supers should be added. 2. Number of supers on a hive.
6. Care for during summer.	1. Protect from robber bees. 2. Time of day and kind of days to examine swarm.
7. Prevent swarming.	1. Condition and appearance of hood previous to swarming. 2. Location, identification and destruction of possible queen cells.
8. Requeening.	1. How to raise Queens. 2. Where to buy Queens. 3. When to Requeen. 4. How often is requeening necessary.
9. Remove honey.	1. Time of year for honey removal. 2. Condition of swarm for honey removal. 3. Method of removal.
10. Protect during winter.	1. Shelter necessary—packing or cellar protection. 2. Temperature requirements. 3. Feed requirements.
11. Care during spring.	1. Feed requirements. 2. Desirable strength of swarms.

Reference: Farmers' Bulletins, U. S. Department of Agriculture—447, 961.

V. Reference List.

Books

Key	Author	Book	Publisher
G.	<i>Grim</i>	"Elementary Agriculture"	Allyn & Bacon, N. Y.
C.	<i>Cromwell</i>	"Agriculture & Life"	J. B. Lippincott Co., Philadelphia, Pa.
D.	<i>Davis</i>	"Productive Farming"	J. B. Lippincott Co., Philadelphia, Pa.
S.	<i>Schmidt, G. A.</i>	"Laboratory, Field & Project Guide to Agriculture"	D. Appleton & Co., New York City.
SK.	<i>Skilling, W. T.</i>	"Nature Study Agriculture"	World Book Co., New York.
F. B.		Farmers Bulletins—U. S. Department of Agriculture, Washington, D. C.	
Pa.		Bulletins from School of Agriculture, State College, Pa.	

NOTE—Write to "Division of Publications," U. S. Department of Agriculture, Washington, D. C. and ask for "list of Farmers' Bulletins."

Books for teacher's shelf.

Freeland—"Elementary School Practice."—Macmillan Co., N. Y.

Storm & Davis—"How to Teach Agriculture"—J. B. Lippincott, Philadelphia.

Bailey—"School book of Farming"—Macmillan Company, N. Y.

McCready—"Rural Science Reader"—D. C. Heath & Co.

Colvin Stevenson—"Farm Projects"—Macmillan Co., N. Y.

Farm Papers

The Pennsylvania Farmer, Philadelphia, Pa.

The National Stockman & Farmer, Pittsburgh, Pa.

The Country Gentleman, Philadelphia, Pa.

The Poultry Item, Sellersville, Pa.

The Farm Journal, Philadelphia, Pa.

How to Organize and Conduct Junior Home Projects.

APPENDIX A.

- I. Tell the pupils about the opportunities junior home project work offers them. Stress the facts that it gives them a chance to do something themselves—to learn by doing, to win a prize at a contest or exhibit, to secure a certificate of achievement for successful completion of project, to earn some money.
- II. Tell about boys and girls in Pennsylvania, who have conducted junior home projects.

Examples

- A. Meda Calaman—Twelve years of age, a pupil in the Blosserville School, chose chicken raising as her project. She secured three settings of pure-bred Rhode Island Reds, hatched 37 chicks and raised every chick except one which died as the result of an accident. With the assistance of her father, the male birds of the flock were caponized and these birds prepared for holiday markets which aided materially in making an unusually good margin of profit. After deducting all expenses for labor, feed, etc., she made a profit of \$57.59.
- B. Jacob Berkheimer—Sixteen years old, attended the Reiffs' School, and selected a truck patch as his project. Jacob made a special study of insects and diseases affecting garden crops. By controlling the mildew he was successful in raising an unusually fine crop of fall peas. The garden turned out a net profit of \$30.42 and Jacob planned a much larger truck patch as his project for next season. This truck patch consisted of one acre: Products valued at approximately \$350.00 were raised—the profit exceeded \$200.00—This money helped Jacob get started in his Agricultural Course at the Pennsylvania State College.
- C. Bessie Nangle—Fourteen years old, a pupil of the Centerville School, had unusual success with her pure-bred White Leghorns. Bessie set 30 eggs, 30 chicks were hatched from these eggs, and every chick lived and thrived until ready to go to market. Bessie's records show that her chicks made her a net profit of \$22.52.

- III. Suggest the projects they may carry on for the particular year, such as growing a garden, growing corn, growing potatoes, growing a truck crop of beans, cabbage, strawberries, sweet corn or tomatoes; or raising chicks, keeping hens for egg production, raising and fattening pigs, raising a calf, raising rabbits or keeping bees.
- IV. Have pupils make temporary selection of particular junior projects they would like to undertake.
- V. Distribute enrollment cards. (The junior project enrollment cards may be secured from the Department of Public Instruction.)
- VI. Have pupils discuss the matter with their parents and secure their cooperation and permission.
- VII. Have pupils make final selection. Make an effort to have every boy and girl decide definitely upon a project. Secure junior project record books. Have pupils keep accurate records.
- VIII. Have pupils organize into a group—elect president, vice-president, secretary. Have them adopt a suggestive name as, “The Junior Project Potato Growers of School,” or “The Junior Project Gardeners of School or Township.” Allow no pupil to be a member of the group unless he will carry on an actual project.
- IX. Have pupil make a definite start by taking the first “activity steps” as outlined for the different projects. The “knowledge required” will serve as a guide to the instruction necessary to enable the pupils to make the “activity steps” successful.
- X. The progress of the junior project can be determined at any time by the number of activity steps the pupil has taken.
- XI. Supervise the work either by personal visits to the home of the pupil yourself or by someone interested. Confer with the parents and be sure they are interested in the successful completion of the undertaking of their children. Invite the County Superintendent of Schools to visit projects with you.
- XII. Provide hikes, trips to different projects, contests, games and group meetings during the summer.
- XIII. Plan for a fall exhibit at which products, record books, and stories be exhibited. Do this before school closes in the spring. It will serve as an incentive for good work during the summer.
- XIV. Have fall exhibits and roundups. Make awards of certificate of achievement for successful completion.

- XV. Write Department of Public Instruction regarding any additional information or help needed.

HOW TO MAKE AGRICULTURAL BOOKLETS

- I. Materials: Writing or laboratory note paper, 8x10, 8½x11 or 9x12 inches, construction paper, cards or paper fasteners, scissors, paste, clippings from farm papers, magazines or old bulletins.
- II. Method.
 - A. Decide upon kind of booklet to be made—example, poultry, corn, nut, pig, wild animal, farm power or any booklet relating to agriculture and agricultural life.
 - B. Outline table of contents.
 - C. Place this outline neatly on page 1 with appropriate design, poem or photograph relating to main theme of the booklet.
 - D. On page 2, 3, 4, 5, etc. write neatly in ink a discussion of the various topics outlined as indicated by the table of contents. Be careful about margins.
 - E. Use illustrations, pictures, poems freely. Place them artistically. Write only on one side of the paper, paste only corners of photographs.
 - F. Use colored construction paper about one-fourth inch larger on all sides than the writing paper for covers.
 - G. Print the name of booklet neatly on the cover page and design with original design, drawing or photograph.
 - H. Bind at side or top with cord or paper fasteners—cord gives the more desirable results.
- III. Use.
 - A. To correlate agriculture with writing, language drawing and design.
 - B. To develop individuality, originality and independence of expression.
 - C. To provide attractive exhibit and contest material.

SUGGESTIONS FOR AN AGRICULTURAL FAIR AND RURAL LIFE DAY

Ten suggestions for conducting Agricultural Fairs, Community Days and Rural Life Days.

1. Exhibit products grown by pupils in project work; accompanying each project exhibit with the project record book or a placard announcing important details regarding the project.



Community Days are enjoyed by young and old alike.

2. Part of exhibit should be devoted to a competitive exhibit for parents and patrons. Label uncommon vegetables such as Kohl Rabi, Brussels Sprouts, etc.
3. Separate prizes should be awarded for these two classes. Ribbons or award cards make satisfactory prizes.
4. If a district exhibit is held, it can be made a competitive exhibit by schools. Include in school exhibits, compositions, booklets, posters, types of hand work, maps, examples of penmanship and other regular school work of the pupils.
5. Plan program so as to have something that will be of interest to both parents and pupils. Include a number of exercises by the pupils of the school.
6. Have athletic events in the forenoon, a school play or exercises by the pupils in the afternoon and addresses by the County Superintendent of Schools, and an additional speaker from outside of the community for the evening meeting. Include, if possible, some community singing in the evening program.
7. Plan to decorate the schoolroom or hall where the exhibits will be held.
8. Give the pupils a large share of the responsibility in advertising the affair. Pupils may write invitations to parents and neighbors, make posters, write articles for local papers, etc.
9. If the affair includes exhibits by schools, advise all schools as to the basis on which the exhibit will be judged as far in advance of the display as possible. The score card presented below may prove useful:

a. Arrangement of display	20 points
b. Number of exhibits	20 points
c. Quality of school work exhibits (booklets, maps, drawing, etc.)	15 points
d. Quality of agricultural exhibits (corn, potatoes, vegetables, fruit, etc.)	15 points
e. Quality of home craft exhibits (canned goods, baked goods, floral displays, sewing etc.)	15 points
f. Labeling of exhibits	5 points
g. Presenting the school name and decorating the exhibit	10 points
	<hr style="width: 10%; margin: 5px auto;"/> 100 points
10. Everyone in the community should have a contribution to make to an Agricultural Fair or Rural Life Day. Enlist all the support possible to make the affair a success.



Community Day Exhibit—Display of Farm and Home Craft Products in
Basement of Rural Church.

SYLLABUS IN AGRICULTURE FOR
HIGH SCHOOLS

SYLLABUS IN GENERAL AGRICULTURE FOR HIGH SCHOOLS

I. Introduction

Agriculture is one of the most ancient of the occupations of man. From the most primitive to the most modern stage of family life the members needed to be provided with food, shelter and clothing. In the early stages, food was secured by hunting, fishing and the collecting of edible roots and nuts; a cave or sheltered nook served as shelter; clothing was secured from the skins of animals. In the later stages, shepherding, domestication of animals, the training of beasts of burden and the use of animals for food became an essential part of the industry; seeds were stored and planted; cultivation of plants for food and clothing developed; trading was established; division of labor resulted; until today agriculture is one of our most complex occupations. It still remains the basis of civilization.

Previously all men were farmers. Today the percentage of our population who are farmers has decreased. All, however, remain dependent upon those who till the soil, husband the animals, and produce the essential elements whereby families are clothed, fed and sheltered.

The development of this industry has paralleled the development of the Nation. The American continent has witnessed all its stages since the settlement at Jamestown and the landing of the Pilgrims. The American farm and the American farmer of today represent the highest type in this agricultural development.

II. Aims of the course

- A. To present a historical background of the development of agriculture in America.
- B. To become familiar with some of the social, economic, scientific and occupational phases of farm life.
- C. To provide such activities as will give those contemplating agriculture as a vocation sufficient experience to enable them to determine more wisely their adaptability to farming as a career.

III. Organization

The work has been arranged in a topical sequence. One unit of credit may be had for successful completion of the course. This involves the equivalent of one sixty-minute recitation period daily. It is suggested that four sixty-minute recitation or discussion periods be used weekly and one ninety-minute period per week be used

for field trips, demonstrations or laboratory. The junior project should be begun in the spring of the year. Credit should be withheld for the course until this phase of the work has been completed successfully.

IV. *Methods*

A variety of methods are adaptable to the course. In addition to the usual methods of recitations, class discussions and field trips, the following are suggested:

A. *Demonstration.* Have one of the older farmers of the community demonstrate to the class the use of the cradle, flail, "winnowing" or some other agricultural practice not in use at the present time. Have them demonstrate also some of the best phases of modern practice.

B. *Lectures.* Have retired farmers in the community tell the class about farming practices and methods of their boyhood days. Have active progressive farmers tell the class about methods and practices now in use.

C. *Trips.* (1) Take class to the County Historical Museum; Have them see and discuss implements used by their forefathers; (2) Make trips to up-to-date farms and study present day methods.

D. *Reports.* Have individual pupils read and report on topics such as:

1. The evolution of the grain binder.
2. Farm recreations.
3. The farm as a home.
4. Superstitions of the farmer.
5. Life history and control of the Hessian fly, etc.

E. *Debates.* Have a debate on a farm question monthly. Suggestive questions are:

1. Resolved, That the farm is a better place to raise a family than the city.
2. Resolved, That every farmer should be a member of the County Farm bureau.
3. Resolved, That poultry raising is more profitable than dairying.
4. Resolved, That every farmer keeping dairy cattle should have a silo.

E. *Projects.* Each pupil should be encouraged to carry on a junior project in the actual production of a crop or animal on an economic basis. Aim "C" will not be realized unless this is done.

Use should be made constantly of the local agricultural environment. Each community doubtless has contributed something to the agricultural development of the Nation. Each community doubtless has some agricultural practices peculiar to itself. Use these as a basis for developing methods of agricultural practice common to the communities. Frequent use should be made of all local help available, current farm papers, magazines, industrial exhibits, and up-to-date agricultural literature. Have your school placed on the mailing list of the United States Department of Agriculture, Washington, D. C. and the Pennsylvania State College, State College, Pa., to receive all publications issued.

V. Outline of topics to be treated.

A. Early agriculture in America.

1. Agriculture of the American Indian.

- a. In New England.
- b. Surrounding the Great Lakes.
- c. In the Southwest.
- d. On the Pacific Coast.

Suggested topics regarding each.

- a. Plants raised and used for food and shelter; cultural and harvesting methods.
- b. Animals used.
- c. Implements used for agricultural purposes.

2. Colonial agriculture.

- a. In Virginia.
- b. In New England.
- c. In Middle Atlantic States.
- d. In the Carolinas.

Suggested topics regarding each.

- a. The principal crops and cultural methods.
- b. Live stock and methods of feeding.
- c. Introduction of crops and animals.
- d. Size of farms.
- e. Agricultural labor.
- f. Social conditions.

3. Improvement of early American agriculture.

- a. By improvement and introduction of new crops, animals, and cultural methods.
 - (1) Timothy Hanson developed timothy from native grass in 1720.
 - (2) Washington and Jefferson experimented with various plants and kept accurate diary of different cultural methods.

- (3) Book on agriculture written and published by Jared Elliott in 1750.
- (4) Morgan horses developed in New England in 1800.
- (5) Henry Clay, first importer of Hereford cattle in 1817.
- (6) Mules developed on Washington's farm at Mount Vernon.

b. By organization of Agricultural Societies—activities consisted of organizing exhibits of farm crops and animals and promoting contests such as plowing matches, etc. Early agricultural societies:

- (1) Charlestown, S. C. 1784.
- (2) Philadelphia, Pa. 1785.
- (3) New York, N. Y. 1791.
- (4) Massachusetts 1792.

c. By agricultural journals; early publications:

- (1) The Plow Boy, Albany 1819.
- (2) The American Farmer, 1819.
- (3) The New England Farmer, Boston, 1822.
- (4) The New York Farmer, New York, 1827.
- (5) The Southern Agriculturist, Charlestown, 1828.

4. The farm of our grandfathers—Pennsylvania farm of 1850-60.

- a. Activities on the farm—clearing the land, building house and barn, building fences, plowing and tilling the soil, planting, hoeing, harvesting crops, threshing, butchering, cleaning grain, (winnowing) caring and feeding animals, making ax-helves, ox-yokes, wooden bowls, spoons, chairs, furniture for the home, etc.
- b. Activities in the home—baking, dyeing and bleaching linen, making clothing, churning, making candles, making soap, drying fruit and vegetables, etc.
- c. Animals on the farm—cows, oxen, horses, sheep, poultry, dogs—uses of each.
- d. Crops grown—corn, oats, rye, potatoes, buckwheat, wheat, flax, fruit, vegetables—uses of each.
- e. Implements used—axe, sickle, scythe, cradle, crude plow, harrow, drag, hoe, shovel, hand rake, fork, flail.
- f. Cooperating and social activities—husking bees, "schnitzing" parties, barn raisings, butcherings, plowing matches, mowing and cradling matches, spelling bees, quilting parties, singing schools.

B. Modern agriculture of other lands.

1. The agriculture of England, France, Germany, Italy, Holland, Norway, Denmark, Australia, Canada, Mexico, China.
2. Topics suggested for consideration for each of the above.
 - a. Social life of the farmers.
 - b. Size of farms.
 - c. Products raised.
 - d. Use of animals.
 - e. Use of farm machinery.

C. Modern agriculture in Pennsylvania.

1. The modern farm.
 - a. Present day activities on the farm: feeding animals, raising crops with machinery, repairing machinery, building fences, combating insects and diseases by spraying, preparing produce for the market.
 - b. The farm home—activities in the home, comforts, labor saving devices.
 - c. Things with which the farmer works.
 - (1) Plants—kinds for food, manufacture, building, pleasure; how plants feed, photosynthesis.
 - (2) Animals—domesticated and wild; for food, work, clothing, soil fertility, and pleasure.
 - (3) Soil—source, composition, methods of tillage relation to farmers' success.
 - (4) Water—sources, uses, how controlled.
 - (5) Air—composition, use by plants and animals.
 - (6) Implements—horse drawn, as plow; machines as mower, power machines, as tractors; the part implements and machinery play in the farmer's life.
 - (7) Other farmers—neighbors, business relations.
2. Important crops grown on Pennsylvania farms.
 - a. Wheat, corn, oats, rye, clover, alfalfa, timothy, buckwheat, tobacco, potatoes, truck crops, tree fruits, small fruits.
 - b. Study outline for each crop.
 - (1) Importance and production in Pennsylvania and in the United States (See U. S. census and State crop reports).
 - (2) Origin and early history.
 - (3) Study of the plant, form, parts and use of parts.
 - (4) Varieties or kinds.
 - (5) Soils, climate, cultural methods.
 - (6) Diseases and insect pests and control.
 - (7) Ways of improving the crop.
 - (8) Methods of marketing crop.

3. Important animals on Pennsylvania farms.
 - a. Horses, cattle, swine, sheep and poultry.
 - b. Study outline for each kind.
 - (1) Importance and production in Pennsylvania and in the United States.
 - (2) Origin and history.
 - (3) Study of life habits, needs and care required.
 - (4) Usefulness to man.
 - (5) Breeds and strains.
 - (6) Ways of improving for man's purposes.
 - (7) Methods of marketing.
4. Modern farm machinery on Pennsylvania farms.
 - a. Kinds of machinery.
 - (1) Tillage machines—plows, harrows, rollers, cultivators.
 - (2) Planting machines—seeders, grain drills, corn, potato, cabbage and tobacco planters.
 - (3) Harvesting machines—binders, corn harvesters, mowers, hay tedders, hay rakes, hay loaders, potato diggers.
 - (4) Power machines—tractors, steam engines, gasoline engines, dynamos, rams, windmills, etc.
 - (5) Miscellaneous—hay forks and tracks, manure spreaders, lime spreaders, ensilage cutters, feed grinders, threshing machines, family mills, spraying machines, gasoline engines, farm tractors, milking machines.
 - b. Study outline. (Supplement with machinery catalogs).
 - (1) History and development.
 - (2) Construction.
 - (3) Use and importance to the farmer.
 - (4) Special care and attention required.
5. Types of farming occupations in Pennsylvania.
 - a. General farmer.
 - b. Special types.
 - (1) Dairyman.
 - (2) Poultryman.
 - (3) Stock raiser.
 - (4) Florist.
 - (5) Fruit grower.
 - (6) Gardener or trucker.
 - (7) Nurseryman.
 - (8) Lumberman.
 - (9) Forester.

- (10) Apiarist.
- (11) Farm laborer.
- c. Study outline for each type of occupation.
 - (1) Importance to community and to society.
 - (2) Training required.
 - (3) Work performed.
 - (4) Advantages and disadvantages.
 - (5) Requirements of those engaged in each occupation.
 - (6) Healthfulness of each occupation.
 - (7) Possibilities for earning good income.
- d. Reference—"Studies of Occupations in Agriculture, Forestry, and Animal Industry," by Frederick J. Allen, Bureau of Vocational Guidance, Harvard University, Cambridge, Mass. (Price 40 cents.)
- 6. Aids to the farmer.
 - a. Business aids; the work of each.
 - (1) United States Department of Agriculture.
 - (2) Pennsylvania Department of Agriculture.
 - (3) Pennsylvania State College.
 - (4) County Farm Bureau.
 - (5) Vocational agricultural schools.
 - (6) Farm products shows and fairs.
 - (7) Agricultural societies.
 - (8) Grange.
 - (9) Cooperative buying and selling organization.
 - (10) Farm newspapers and magazines.
 - (11) Banks.
 - b. Social aids—how they have helped the farmer.
 - (1) Automobile.
 - (2) Good roads.
 - (3) Rural free delivery.
 - (4) Public libraries.
 - (5) Chautauquas.
 - (6) Good schools.
 - (7) Church.
 - (8) Grange.
 - (9) Telephone.
 - (10) Radio.
 - (11) Musical instruments.

VI JUNIOR HOME PROJECTS.

The junior project should consist of actual participation, on an economic basis, in one of the productive farm enterprises. Suggestions.

- A. Growing corn.
- B. Growing a garden.
- C. Growing potatoes.
- D. Growing truck, as beans, cabbages, strawberries, etc.
- E. Growing chicks.
- F. Keeping poultry for eggs.
- G. Raising pigs.
- H. Raising a calf.
- I. Raising rabbits.
- J. Keeping bees.

In the outlines that follow an analysis is made of each of the projects suggested. "Activity steps" refer to the actual jobs or things to be done in the project activity. The "knowledge required" relates to that information that is necessary to successfully take the "activity steps." For more detailed information regarding the organization of junior projects, write the Department of Public Instruction.

Corn Project—Grow Corn

Activity Steps	Knowledge Required
1. Select variety	<ul style="list-style-type: none"> 1. Varieties of corn. 2. Adaptation to community and use.
2. Select land for planting	<ul style="list-style-type: none"> 1. Soils best for corn. 2. Fertility. 3. Location.
3. Secure seed	<ul style="list-style-type: none"> 1. Best time to select seed. 2. Advantages of local or foreign seed. 3. Advantages of pure bred seed. 4. Amount. 5. Cost.
4. Test seed corn for germination	<ul style="list-style-type: none"> 1. Preparation for test. 2. Methods of making test. 3. Germination requirements. 4. Reading the test.
5. Prepare soil for planting	<ul style="list-style-type: none"> 1. Implements needed. 2. Time of year. 3. Operations. 4. Requirements of good seed bed.
6. Plant seed	<ul style="list-style-type: none"> 1. Time to plant corn. 2. Dept. of planting. 3. Distance in row and between rows. 4. Rate. 5. Fertilizer to use.
7. Cultivate the crop	<ul style="list-style-type: none"> 1. Time of cultivation for corn. 2. Frequency. 3. Depth. 4. Nearness to stalks.

Corn Project—Grow Corn

(Continued)

Activity Steps	Knowledge Required
8. Cut and shock the corn	<ol style="list-style-type: none"> 1. Indications of maturity. 2. Time of year. 3. Methods and materials used and needed.
9. Husk the corn	<ol style="list-style-type: none"> 1. Proper time to husk. 2. Methods and materials needed.
10. Store the corn	<ol style="list-style-type: none"> 1. Storage requirements of corn.
11. Sell the corn	<ol style="list-style-type: none"> 1. Time of year to sell corn. 2. Price. 3. Markets.
References: Farmers' Bulletin, U. S. Department of Agriculture—537—How to grow an acre of corn.	

Wilson & Warburton: Farm Crops—Webb Pub. Co.—St. Paul, Minn.

Garden Project—Grow a Garden

Activity Steps	Knowledge Required
1. Select land for garden	<ol style="list-style-type: none"> 1. Kinds of soil best for garden. 2. Amount. 3. Location and drainage.
2. Plan the garden	<ol style="list-style-type: none"> 1. Space requirements of different plants. 2. Light requirements of different plants. 3. Vegetables to be planted. 4. Maturity requirements of different crops. 5. Succession cropping. 6. Inter-cropping.
3. Secure manure and fertilizers	<ol style="list-style-type: none"> 1. Kinds of fertilizers. 2. Value of manure for garden. 3. Rate and time of application.
4. Secure seeds	<ol style="list-style-type: none"> 1. Best seed houses. 2. Amount and kind needed. 3. How to order.
5. Grow young plants	<ol style="list-style-type: none"> 1. Time to start seeds. 2. Requirements for growing seeds. 3. Diseases and methods of control.
6. Spade or plow the garden	<ol style="list-style-type: none"> 1. Time of year. 2. Condition of soil for spading. 3. Method.
7. Prepare seed bed	<ol style="list-style-type: none"> 1. Tools necessary. 2. Requirements of a good soil.

Garden Project—Grow a Garden

(Continued)

Activity Steps	Knowledge Required
8. Plant the seeds and plants	1. Requirements of different seeds and plants as to depth, time of planting, distance between rows, etc.
9. Cultivate the garden	1. How soon after planting. 2. How soon after rains. 3. Depth for different plants. 4. Frequency.
10. Harvest vegetables	1. Method. 2. Frequency.
11. Sell the vegetables	1. Preparations necessary for market. 2. Requirements of market. 3. Market price.

References: Farmers' Bulletins, U. S. Department of Agriculture—Nos. 937 and 1044.

Watts—Vegetable Gardening, Macmillan Co., N. Y.

Potato Project—Grow Potatoes

Activity Steps	Knowledge Required
1. Select variety	1. Varieties of potatoes. 2. Demands of market. 3. Tendency to freedom from disease.
2. Secure seed	1. Where can seed be secured? 2. Advantages of disease-free seed. 3. Amount of seed needed. 4. Cost.
3. Select land for planting	1. Soils best adapted for potatoes. 2. Location and drainage. 3. Fertility of soil. 4. Amount of land.
4. Care for seed	1. Methods to prevent sprouting. 2. Methods to prevent rotting.
5. Prepare soil for planting	1. Implements and machines needed. 2. When to prepare soil. 3. Cost.
6. Secure fertilizer	1. Kinds of fertilizer best for potatoes. 2. Amounts needed. 3. Cost. 4. Where secured.
7. Plant the seed	1. When should potatoes be planted. 2. Depth of planting. 3. Distance in row and between the rows. 4. Application of fertilizer.

Potato Project—Grow Potatoes

(Continued)

Activity Steps	Knowledge Required
8. Cultivate the crop	<ol style="list-style-type: none"> 1. Time of cultivations. 2. Frequency of cultivations. 3. Depth of cultivation. 4. Last cultivation.
9. Spray the crop	<ol style="list-style-type: none"> 1. Time of sprayings. 2. Frequency of sprayings. 3. Materials needed. 4. Method of application.
10. Dig the potatoes	<ol style="list-style-type: none"> 1. When crop is mature. 2. Condition of soil best for digging.
11. Store the crop	<ol style="list-style-type: none"> 1. Storage requirements.
12. Sell the potatoes	<ol style="list-style-type: none"> 1. When to market potatoes. 2. Best market. 3. Prevailing price.

References: "Successful Potato Growing"—The Barrett Co., Baltimore, Md.

Montgomery: Productive Farm Crops—J. B. Lippincott Co., Phila.

Truck Project—Grow beans, cabbage, strawberries, sweet corn, tomatoes, etc.

Activity Steps	Knowledge Required
1. Select land	<ol style="list-style-type: none"> 1. Kind of soil best for particular crop. 2. Amount of land. 3. Location, drainage, etc.
2. Secure seed or plants	<ol style="list-style-type: none"> 1. Varieties needed. 2. Where they can be secured. 3. Amount needed.
3. Secure manure or fertilizer	<ol style="list-style-type: none"> 1. Kinds and amounts for particular crops. 2. Needs of particular soils. 3. Methods of application. 4. Cost.
4. Prepare soil for planting	<ol style="list-style-type: none"> 1. Time of year. 2. Implements needed. 3. Condition of soil. 4. Cost of preparation.
5. Plant the plants or seeds	<ol style="list-style-type: none"> 1. Time of year. 2. Time of day. 3. Depth. 4. Distance in row and between rows.

Truck Project—Grow beans, cabbage, strawberries, sweet corn, tomatoes, etc.

(Continued)

Activity Steps	Knowledge Required
6. Cultivate the crop	<ol style="list-style-type: none"> 1. How soon after planting. 2. Frequency. 3. How soon after a rain. 4. Depth for particular crops. 5. Implements to use.
7. Protect from diseases and pests	<ol style="list-style-type: none"> 1. Insects and pests common to particular crop. 2. Method and materials to control.
8. Harvest the crops	<ol style="list-style-type: none"> 1. Time to harvest different crops. 2. Method.
9. Sell the product	<ol style="list-style-type: none"> 1. Preparation for market. 2. Market demands. 3. Market price.

References: Pennsylvania State College—Bulletin—76.

Watts—Vegetable Gardening Revised, Macmillan Co., N. Y.

Poultry Project—Grow Chicks

Activity Steps	Knowledge Required
1. Select a breed	<ol style="list-style-type: none"> 1. Kinds of breeds—advantages and disadvantages. 2. Adaptation of particular breeds to particular needs. 3. Personal fancy.
2. Secure eggs	<ol style="list-style-type: none"> 1. Number of eggs needed. 2. Where eggs may be secured. 3. When to secure eggs. 4. Cost.
3. Make and place the nest	<ol style="list-style-type: none"> 1. Materials best for nests. 2. Size, shape of nests. 3. Best location for a nest.
4. Set the hen	<ol style="list-style-type: none"> 1. What constitutes a good "sitter." 2. How to determine above. 3. Time of day to set hen. 4. Number of eggs per hen.
5. Care for the sitting hen	<ol style="list-style-type: none"> 1. Food requirements. 2. Disease and lice prevention.
6. Care for the hatch	<ol style="list-style-type: none"> 1. When to expect hatch. 2. Attention required while hatching.
7. Prepare coop for chicks	<ol style="list-style-type: none"> 1. Materials to be used. 2. Size of coop. 3. Protection from rodents and animals. 4. Disinfectant methods. 5. Location.

Poultry Project—Grow Chicks

(Continued)

Activity Steps	Knowledge Required
8. Take the hatch from the nest	<ol style="list-style-type: none"> 1. How soon after hatching. 2. Method of handling. 3. Time of day. 4. Treatment for lice.
9. Feed the young peeps	<ol style="list-style-type: none"> 1. Time for first feed. 2. Kinds and amount of first feed. 3. Feeding methods for two weeks.
10. Feed and care for growing chicks	<ol style="list-style-type: none"> 1. Feeding methods for growing chicks. 2. Importance of cleanliness, regularity, etc.
11. Dispose of surplus stock	<ol style="list-style-type: none"> 1. Best age for selling surplus stock. 2. Markets best for particular product.

References: Farmers' Bulletins, U. S. Department of Agriculture, Numbers 1040, 1108, 1111.

Pennsylvania State College—Bulletins 47 and 68.

Jackson, H. W.—The Chick Book—Reliable Poultry Journal—Quincy, Ill.

Poultry Project—Keep Poultry

Activity Steps	Knowledge Required
1. Select the breed	<ol style="list-style-type: none"> 1. Kinds of breeds—advantages and disadvantages. 2. Adaptation of particular breeds to particular needs. 3. Personal fancy.
2. Secure the birds	<ol style="list-style-type: none"> 1. Where particular breed can be secured. 2. Approximate cost. 3. Best age for laying. 4. Purity of stock.
3. Prepare the house	<ol style="list-style-type: none"> 1. Size house necessary. 2. Desirable location. 3. Standards for interior fixtures.
4. Feed the hens	<ol style="list-style-type: none"> 1. Best food for egg production. 2. Amount of feed at a feeding. 3. Methods of feeding.
5. Care and manage the flock	<ol style="list-style-type: none"> 1. Methods of disease prevention and control. 2. Supplementary foods for egg production. 3. Food, water, cleanliness, and regularity as essentials in management. 4. Cost of food and management.

Poultry Project—Keep Poultry

(Continued)

Activity Steps

Knowledge Required

- | | |
|--------------------------------|---|
| 6. Collection and care of eggs | 1. Time to collect.
2. Method of collection.
3. Storage of eggs. |
| 7. Sell the eggs | 1. Frequency of selling for good quality.
2. Where are good markets? |

References: Farmers' Bulletins, U. S. Department of Agriculture, 889, 898 1040, 1105, 1112, 1113.

Pennsylvania State College—Bulletins 47 and 62.

Lewis, H. R.—Productive Poultry Husbandry—J. B. Lippincott Co., Phila., Pa.

Pig Project—Raise and Fatten Pigs

Activity Steps

Knowledge Required

- | | |
|-------------------------|--|
| 1. Select the breed | 1. Different breeds of pigs and advantages and disadvantages.

1. Where particular breeds can be secured. |
| 2. Secure the pig | 2. Probable cost.
3. Advantages of pure breeds.
4. Individual points to be considered in selecting pig. |
| 3. Provide shelter | 1. Type of pen needed.
2. Size.
3. Location desirable. |
| 4. Provide range | 1. Size or space per pig.
2. Location.
3. Fencing requirements.
4. Crops to be grown in range. |
| 5. Keep the pig growing | 1. Proper food requirements.
2. Proper water requirements.
3. Proper exercise needed for hogs.
4. Proper health requirements. |
| 6. Fatten the pig | 1. Desirable age for fattening.
2. Food, water and exercise requirements for fattening. |
| 7. Sell the pig | 1. Age to sell.
2. Conditions of salable fatted pigs.
3. Price required for profit. |

References: Farmers' Bulletin, U. S. Department of Agriculture—878—Swine Management.

Pennsylvania State College—Bulletin 77, Swine Feeding and Management.

Dawson, H. C.—"Success with Hogs"—Forbes & Co., Chicago.

The Pig Book for Boys and Girls, by Smith and Shanklin, & B. Lippincott Co. Phila.



A pig project—In selecting a pig to be raised as a brood sow the pupil applies to his knowledge of judging. In the care and feeding of the litter, the pupil applies and increases his knowledge of the care and feeding of little pigs.

Calf Project—Raise a Calf

Activity Steps

Knowledge Required

- | | |
|------------------|--|
| 1. Select breed | 1. Different breeds of dairy cattle.
2. Adaptation of breeds for particular purposes and conditions. |
| 2. Buy a calf | 1. Where desirable calf can be secured.
2. Probable cost.
3. Individual points to be considered in buying calf.
4. Advantage of pure breeds vs. grades. |
| 3. Wean calf | 1. At what age calves should be weaned.
2. Method of teaching calves to drink from pail. |
| 4. Feed calf | 1. Necessary foods,—concentrates, roughage.
2. Frequency of feeding.
3. Amount at different ages. |
| 5. Care for calf | 1. Importance of plenty of good food and water.
2. Importance of shelter.
3. Importance of grooming and care. |

References: Farmers' Bulletin, U. S. Department of Agriculture—777.
 Pennsylvania State College—Circular 60—Raise the Heifer Calf.
 Washburn: Productive Dairying—J. B. Lippincott Co.—Phila., Pa.

Bee Project—Keep Bees

Activity Steps

Knowledge Required

- | | |
|---------------------------|--|
| 1. Secure a swarm | 1. Where swarms may be secured.
2. How to secure a wild swarm. |
| 2. Secure a hive | 1. Where bees can be purchased.
2. Possible cost.
3. Desirable kinds. |
| 3. Place the hive | 1. Best location for bees.
2. Distance from the ground.
3. Distance between the hives. |
| 4. Hive the swarm | 1. Equipment needed for handling bees.
2. Operations and methods of "hiving." |
| 5. Prevent swarming | 1. Condition and appearance of brood chamber previous to swarming.
2. Location, identification and destruction of possible queen cells. |
| 6. Place supers | 1. When additional supers should be added
2. Number of supers on a hive. |
| 7. Care for during summer | 1. Protect from robber bees.
2. Time of day and kind of days to examine swarm. |

Bec Project—Keep Bees

(Continued)

Activity Steps	Knowledge Required
8. Remove honey	<ol style="list-style-type: none"> 1. Time of year for honey removal. 2. Condition of swarm for honey removal. 3. Method of removal.
9. Protect during winter.	<ol style="list-style-type: none"> 1. Shelter necessary. 2. Ventilation needed. 3. Temperature requirements. 4. Feed requirements. 5. Packing box versus cellar method of wintering.
10. Care during spring.	<ol style="list-style-type: none"> 1. Feed requirements. 2. Desirable strength of swarms.

References: Farmers' Bulletins, U. S. Department of Agriculture—447, 961.
 The A B C and X Y Z of Beekeeping: A. I. Root Co.—Medina, O.

VII. Bibliography

A. Books

- Sanford*—The Story of Agriculture in the United States—D. C. Heath & Co., Chicago.
- Mann*—Beginnings in Agriculture—Macmillan Co., New York.
- Boyle*—Agricultural Economics—J. B. Lippincott Co., Philadelphia.
- Allen*—Studies of Occupations in Agriculture, Forestry, and Animal Husbandry—1 Lawrence Hall, Harvard University.
- Census of 1920*—U. S. Department of Agriculture, Washington, D. C.
- Davis*—Productive Farming—J. B. Lippincott Co., Philadelphia.
- Berry*—Teaching Agriculture—World Book Co., N. Y.
- Galpen*—Rural Life—The Century Co., N. Y.
- Cromwell*—Agriculture and Life—J. B. Lippincott Co., Philadelphia.
- Carver*—Principles of Rural Economics—Ginn Co., N. Y.
- Grim*—Elementary Agriculture—Allyn & Bacon, N. Y.
- Schmidt, G. A.*—Laboratory, Field and Project Guide to Agriculture—D. Appleton & Co., N. Y.
- Storm & Davis*—How to Teach Agriculture—J. B. Lippincott, Philadelphia.
- Nolan*—A Year in Agriculture—Row, Peterson & Co., Chicago.
- Warren*—Farm Management—Macmillan Co., N. Y.
- Haworth*—George Washington—Farmer—Bobbs-Merrill Co., Indianapolis.
- Babbitt*—Essays on Agriculture—Doubleday, Page & Co., Garden City, N. Y.
- Elbert Hubbard*—Little Journeys—James Oliver—The Roycrofters, N. Y.
- Warner*—Being a Boy (New England Agriculture)—Houghton-Mifflin Co., Chicago.
- King*—Farmers of Forty Centuries (Agriculture of China)—Madison, Wis.
- Williams*—Luther Burbank, His Life & Work—Hearst's Int. Lib.
- Dodge*—Hans Brinker or the Silver Skates (Holland Agriculture)—E. P. Dutton Co., New York.
- Materlink*—Life of the Bee—Dodd, Mead & Co., N. Y.
- Riley*—Farm Rhymes—Bobbs-Merrill Co., Indianapolis.
- Carleton*—Farm Ballads—Harper & Brothers, N. Y.
- Agriculture & Rural Life Day—U. S. Bureau of Education, Washington, D. C.

Agricultural Conditions in Great Britain & Ireland—Iowa Department of Agriculture, Des Moines, Iowa.

Colvin & Stercnson—Farm Projects—Macmillan Co., New York, N. Y.

B. Bulletins

Farmers Bulletins—U. S. Department of Agriculture, Washington, D. C.

Bulletins from School of Agriculture, State College, Pa.

Note—Write to "Division of Publications," U. S. Department of Agriculture, Washington, D. C. and ask for "list of Farmers' Bulletins."

C. Farm papers

The Pennsylvania Farmer, Philadelphia, Pa.

The National Stockman & Farmer, Pittsburgh, Pa.

The Country Gentleman, Philadelphia, Pa.

The Poultry Item, Sellersville, Pa.

The Farm Journal, Philadelphia, Pa.

